Cell Cycle Inquiry Lab: Background Information

Targeted *Standard Course of Study:* Goals and Objectives

Goal 1: The learner will develop abilities necessary to do and understand scientific inquiry.

1.02: Design and conduct scientific investigations to answer biological questions.

1.03: Formulate and revise scientific explanations and models of biological phenomena using logic and evidence to:

j) Explain observations.
k) Make inferences and predictions.
l) Explain the relationship between evidence and explanation.

Goal 3: The learner will develop an understanding of the continuity of life and the changes of organisms over time.

3.02: Compare and contrast the characteristics of asexual and sexual reproduction.

Introduction to the Teacher

Through inquiry techniques, students will recognize the process by which nuclear division occurs. It is recommended that this laboratory activity be completed prior to cell cycle instruction. Onion root tip slides will be observed and the five different stages of the cell cycle will randomly be drawn. Students will then use their drawings to place the cells in the different stages of the cell cycle in a logical sequence to determine the correct order of cellular division. Upon the completion of the activity, the teacher can collect the cards for the lab grade and use the best drawings for classroom discussion.

Students may have trouble visualizing individual cells when viewed under the microscope in small groups. A solution to this would be to use a videoscope, flex cam or overhead transparency to present the students with an enlarged picture of an onion root tip. The teacher could then point out individual cells to stress the importance of what these cells look like and what they represent to prepare students for the inquiry lab. Another alternative would be to modify the laboratory into a whole class activity. Students will need a good understanding of the parts of the cell and the nuclear material before beginning this laboratory.

Some possible extensions of this lab may include the use of whitefish slides in addition to the onion root tip slides. Whitefish slides could be used for the comparison of the stages of the cell cycle. The class could be divided into an even number of groups with half using the onion root tip and half using the whitefish slides. The groups could then compare their diagrams and discuss the similarities and differences between the cell cycle in plant and animal cells. Another suggested extension would involve the use of a computer and data projector or computer lab. Once students have completed the inquiry